Space Weather Forecast

Issued on Friday, 27 May 2022 at 01:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of R1-R2 Radio Blackouts declining. CME arrival likely early day 2 (28th) with Minor to Moderate Storm intervals likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with activity limited to C-class flares. There are currently seven sunspot regions on the visible disc, with a very faint 2019 recently re-appearing. The most notable region remains AR3014, but as it is now very close to the northwest limb this makes it difficult to assess. However, a complex magnetic configuration is still assumed, as notable looping persists on SDO imagery. All other regions are mainly small, magnetically simple and stable.

A weak CME from yesterday morning has been observed in imagery and maybe Earth-directed. The CME has an unknown source.

Solar Wind / Geomagnetic Activity: The solar wind has been ambient in a benign solar wind environment. Total magnetic field strength was mainly weak, with the north-south component of magnetic field weak throughout. Geomagnetic activity has been Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, but with a risk of isolated Moderate activity and a very slight risk of High activity. The regions that are most likely to produce a significant flare are two active regions in the northwest quadrant, with the risk decreasing as the most complex region AR3014 soon rotates off the west limb.

Solar Wind / Geomagnetic Activity: Current ambient solar winds are likely to become enhanced today, due to the arrival of a fast wind from one or two coronal hole features in the western hemisphere. In addition a CME, from the 25th, is expected to arrive early tomorrow at 28/0200 +/- 9 hours. This is likely to be a glancing impact, with solar winds easing back towards background day during 3 (29th). Quiet geomagnetic activity at first is likely to become Unsettled to Active today (27th), with a slight chance of Minor Storms under the influence of the enhanced solar wind. The impact of the CME from the 25th gives a likelihood of Minor Storm intervals, with a chance of Moderate storms, most likely early tomorrow (28th). Geomagnetic activity then decreases from day 3 (29th)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring, although there is a slight chance due to the large sunspots on the northwest disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	60	10	5
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	20	5	5
Very Active	R3 to R5 X	No	5	2	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	2	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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